

IN THE CLAIMS:

Amendments to the Claims

Please cancel claims 3, 7, 23 and 24 without prejudice or disclaimer of the subject matter therein and amend the claims as follows.

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method for detecting a defect, comprising the steps of:

repeatedly obtaining image signals of a same portion of a sample by imaging said sample through an optical system by changing optical conditions;

~~adjusting optical conditions of said optical system by analyzing said~~
repeatedly obtained image signals ~~so as to~~ and selecting plural optical conditions
which decrease a difference of contrast in the image signal among segments
corresponding to a plurality of regions on said sample;

obtaining ~~the image signal~~ signals of said sample under ~~the adjusted~~ said
selected plural optical conditions by imaging said sample with said optical system
~~while scanning said sample in a viewing field of said optical system; and;~~

evaluating images obtained under said selected plural optical conditions to
adjust optical conditions for inspection; and

detecting a defect of said sample by processing ~~the image signal~~ signals of
the sample under said adjusted optical conditions.

2. (currently amended) A method for detecting a defect, comprising the steps of:

~~repeatedly obtaining image signals of a same portion of a sample by illuminating through an optical system and imaging said sample through said optical system while changing optical conditions;~~

~~adjusting according to claim 1, wherein the changing of optical conditions includes selecting different a transmission ratio-ratios of 0-th order diffracted light included in entire light generated by said illumination and reflected from said sample as optical conditions by analyzing said repeatedly obtained image signals so as to decrease a difference of contrast in the image signal among segments corresponding to a plurality of regions on said sample;~~

~~obtaining the image signal of said sample with the adjusted transmission ratio of said 0-th order diffracted light by imaging said sample with said optical systems while scanning said sample in a viewing field of said optical system under the changed optical conditions in that the transmission ratio of said 0-th order diffracted light has been adjusted; and~~

~~detecting defects of said sample by processing the image signal of said sample under the adjusted transmission ratio of said 0-th order diffracted light.~~

Claim 3 (canceled)

4. (currently amended) A method for detecting a defect according to claim 2, wherein ~~said step of the~~ adjusting of the transmission ratio of said 0-th order diffracted light is performed by utilizing a spatial filter that is positioned on or near a

Fourier transform plane of said sample and that reduces the transmission ratio of the 0-th order diffracted light.

5. (currently amended) A method for detecting a defect, comprising the steps of:

illuminating a sample through an optical system;

repeatedly obtaining a plurality of image signals of a same portion of said sample ~~having different transmission ratios of 0-th order diffracted light through said optical system by changing the transmission ratio of the 0-th order light~~ optical conditions included in entire light generated by said illumination and reflected from said sample and imaging said sample;

~~determining~~ selecting plural optical conditions for ~~the transmission ratio of the 0-th order diffracted light on which defect detection sensitivity is increased by~~ analyzing said repeatedly obtained plurality of image signals having the ~~different transmission ratios of said 0-th order diffracted light~~ changed optical conditions;

evaluating images obtained under the selected plural optical conditions and setting the ~~transmission ratio of the 0-th order diffracted light included in the entire light reflected from said sample to said determined~~ optical conditions for inspection in accordance with the evaluation ~~for the transmission ratio~~;

obtaining the image signals by imaging said sample with said optical system while scanning said sample in a viewing field of said optical system under said ~~determined~~ set optical conditions ~~for said transmission ratio of said 0-th order diffracted light~~; and

detecting a defect of said sample by using the image captured under said ~~determined set optical conditions for said transmission ratio of said 0-th order diffracted light.~~

6. (currently amended) A method for detecting a defect, ~~comprising the steps of:~~

~~illuminating a~~ according to claim 5, wherein the sample is illuminated through
an objective lens;

~~obtaining a plurality of images having, and the changing of optical conditions~~
includes providing different transmission ratios of 0-th order diffracted light through
said objective lens by changing the transmission ratio of the 0-th order light included
in entire light generated by said illumination and reflected from said sample and
imaging said sample;

~~determining conditions for the transmission ratio of the 0-th order diffracted~~
~~light on which defect detection sensitivity is increased by using the plurality of~~
~~images having the different transmission ratios of said 0-th order diffracted light;~~

~~setting the transmission ratio of the 0-th order diffracted light included in the~~
~~entire light reflected from said sample to said determined conditions for the~~
~~transmission ratio;~~

~~obtaining the image by imaging said sample through said objective lens under~~
~~said determined conditions for said transmission ratio of said 0-th order diffracted~~
~~light; and~~

~~detecting a defect of said sample by using the image captured under said~~
~~determined conditions for said transmission ratio of said 0-th order diffracted light,~~

~~wherein said step of obtaining a plurality of images by changing the transmission ratio of said 0-th order diffracted light is performed for a plurality of regions on said sample, and a particular value of the transmission ratio of the 0-th order diffracted light with which a brightness difference of the detected images among the plurality of regions of said sample is decreased is set as conditions for the transmission ratio of the 0-th order diffracted light that increase said defect detection sensitivity.~~

Claim 7 (canceled)

Claim 8 (canceled)

Claim 9 (canceled)

Claim 10 (canceled)

11. (currently amended) An apparatus for detecting a defect, comprising:
a stage for loading a sample;
an illuminating system which illuminates the sample loaded on said stage
through an objective lens;

~~an optical control unit which adjusts a transmission ratio of 0-th order diffracted light included in entire light illuminated by said illuminating system and reflected regularly from said sample so as to decrease a difference in contrast in an~~

~~image signal among segments corresponding to a plurality of regions on said sample;~~

~~an imaging optical image detecting unit system which obtains forms an optical image of said sample illuminated by said illuminating unit and detects said optical image with a sensor to output the image signal signals of said sample with the adjusted transmission ratio of said 0-th order diffracted light by imaging said sample under the conditions in that the transmission ratio of said 0-th order diffracted light has been adjusted; and~~

~~an image detecting processing unit which processes said image signal output from said image detecting unit to detect detects defects of said sample by processing the image signal of said sample under the adjusted transmission ratio of said 0-th order diffracted light; and~~

~~wherein said optical a control unit which adjusts the transmission ratio of said 0-th order diffracted light by utilizing a polarization difference between the 0-th order diffracted light and higher order diffracted light controls said image detecting unit to repeatedly detect the optical image of said sample by changing optical conditions, and controls said image processing unit to analyze said repeatedly detected image signals and to select plural optical conditions which decrease a difference of contrast in the image signal among segments corresponding to a plurality of regions on said sample, to evaluate images obtained under the selected plural optical conditions and to determine the optical conditions which are utilized for inspection so as to decrease a different in contrast in an image signal among segments corresponding to a plurality of regions on said sample.~~

12. (currently amended) An apparatus for detecting a defect according to claim 11, further comprising a contrast calculating unit which calculates contrast in the image ~~signal~~signals of said sample.

Claim 13 (canceled)

Claim 14 (canceled)

Claim 15 (canceled)

Claim 16 (canceled)

Claim 17 (canceled)

Claim 18 (canceled)

Claim 19 (canceled)

Claim 20 (canceled)

21. (currently amended) A method for detecting a defect, comprising the steps of:

repeatedly obtaining image signals of a same area of a sample by imaging said sample by changing optical conditions;

~~adjusting optical conditions of an inspection system by analyzing said~~
~~repeatedly obtained image signals so as to~~ and selecting plural optical conditions
which modify a contrast in the image signal;

obtaining image signals of said sample under said ~~adjusted~~ selected plural
optical conditions by imaging said sample with said inspection system; ~~while~~
~~scanning said sample in a viewing field of said inspection system; and~~

evaluating images under said selected plural optical conditions to adjust
optical conditions for inspection; and

detecting a defect of said sample by processing the image ~~signal~~ signals of
the sample obtained through said inspection system under said adjusted optical
conditions.

22. (previously presented) A method according to claim 21, wherein
said optical condition is a polarization state of a light which illuminates said sample in
the step of obtaining.

Claim 23 (canceled)

Claim 24 (canceled)

25. (currently amended) An apparatus for detecting a defect, comprising:
an imaging unit which repeatedly obtains image signals of a same area of a
sample by imaging said sample by changing optical conditions;

~~an adjusting unit which adjusts optical conditions of an inspection system by~~
an analyzing unit which analyzes said repeatedly obtained image signals ~~so as to~~
and selects plural optical conditions which modify a contrast in the image signal;

said imaging unit obtaining image signals of said sample under said ~~adjusted~~
~~optical conditions by imaging said sample with said inspection system while~~
~~scanning said sample in a viewing field of said inspection system;~~ and plural optical
conditions;

an evaluating unit which evaluates images obtained under the selected plural
optical conditions and which adjusts optical conditions for inspections based on the
evaluation; and

a detecting unit which detects a defect of said sample by processing the
image ~~signal~~ signals of the sample obtained through ~~said an~~ inspection system
under said adjusted optical conditions.

26. (currently amended)An apparatus according to claim 25, wherein said
optical ~~condition is~~ conditions include a polarization state of a light which illuminates
said sample ~~in the step of obtaining~~.